8th Guiding Model (Chemistry 2026)

1- (X, Y) two consecutive elements from the first transition series. One of (X) compounds is used as a fungicide, and (Y^{3+}) ion has the same number of unpaired electrons as (X^{2+}) ion.

-Which of the following describes elements (X) and (Y)?

a) X: A brittle element , Y: its alloy with (X) used in plating iron handles.

b) X: Used in plating metals , Y: Used as a catalyst in the Fischer-Tropsh process.

c) X: Not used in its pure form, Y: its alloy with (X) used in railway tracks.

d) X: A good conductor of electricity, Y: Used in galvanizing iron.

2- (X) is a transition element from the first transition series.

-The number of unpaired electrons in its sublevel (d) twice the number of unpaired electrons in copper.

- All of the following represent uses of element (X) except:

a) Coating metals to protect them from corrosion

b) A catalyst in converting vegetable oils into artificial margarine

c) Its alloy with chromium resists corrosion

d) Its alloy with aluminum is used in the manufacture of MiG aircraft

3- The following processes were performed on sample of yellow iron ore (X):

(1): A physical process that reduces the mass of the ore and increases iron percent

(2): A chemical process that reduces the mass of the ore and increases iron percent

(3): A process that did not change the mass of the ore or the iron percent

-Which of the following represents ore (X) and processes (1, 2, and 3)?

	The ore	Process (1)	Process (2)	Process (3)
a)	Siderite	Magnetic separation	Roasting	Electrical separation
b)	Hematite	Roasting	Electrical separation	Sintering
c)	Hydrated iron (III) oxide	Surface tension	Roasting	Cracking
d)	Limonite ore	Roasting	Magnetic separation	Surface tension

4- The following diagram shows the number of unpaired electrons in the oxidation state (3+) for elements from the first transition series.

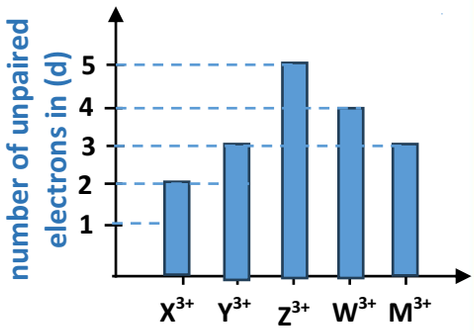
-Which of the following processes occurs most easily?

a) $M^{3+} \rightarrow M^{4+}$

b) $X^{3+} \rightarrow X^{2+}$

c) $Z^{3+} \rightarrow Z^{2+}$

d) $W^{3+} \rightarrow W^{2+}$



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5- The opposite diagram represents a section of the periodic table and virtual Symbols for some elements.

						G
					Z	
A	B	C	D	E		
		M	Y			

-Which of the following is Incorrect?

a) Element (Z) forms two alloys with each of (D and C) Separately those are known by the same name

b) Elements (G, A) form two types of alloys

c) Elements (D, E) form a yellow copper alloy

d) Elements (M, C) form an intermetallic alloy

6- Which of the following is NOT used to distinguish between sodium carbonate And sodium nitrite?

a) Acidified potassium permanganate solution

b) Adding water to each

c) Dilute sulfuric acid

d) Dilute hydrochloric acid

7- Which of the following compounds solutions forms a precipitate with $Pb(NO_3)_{2(aq)}$, But does not form a precipitate with $Ba(NO_3)_{2(aq)}$?

a) Na_2SO_4

b) CH_3COONa

c) NaCl

d) Na_2CO_3

8- Two salts, Na_2X and NaY, undergoes the experiments shown in the following Table:

Experiment	Salt (Na_2X)	Salt (NaY)
$HCl_{(aq)}$ + solid salt	Gas is released	No gas is released
$AgNO_{3(aq)}$ + salt solution	$Ag_2X_{(s)}$ is formed	$AgY_{(s)}$ is formed

Which of the following represents the anion (X) or the anion (Y), and their silver salts?

a) The anion (Y) is likely iodide, and $AgY_{(s)}$ a black precipitate.

b) The anion (X) is likely sulphite, and $Ag_2X_{(s)}$ a white precipitate.

c) The anion (X) is likely sulphide, and $Ag_2X_{(s)}$ a white precipitate.

d) The anion (Y) is likely bromide, and $AgY_{(s)}$ a black precipitate.

9- When concentrated sulphuric acid is added to salt (X), vapors of (Y) are released. And when a solution of these vapors is added to a solution of salt (Z), their color removed.

Which of the following represents (Z, Y, X)?

a) X: $NaI_{(s)}$, Y: $I_{2(v)}$, Z: $Na_2S_2O_{3(aq)}$

b) X: $NaBr_{(s)}$, Y: $Br_{2(v)}$, Z: $Na_2S_{(aq)}$

c) X: $NaNO_{3(s)}$, Y: $NO_{2(v)}$, Z: $Na_2S_{(aq)}$

d) X: $NaI_{(s)}$, Y: $I_{2(v)}$, Z: $Na_2SO_{3(aq)}$

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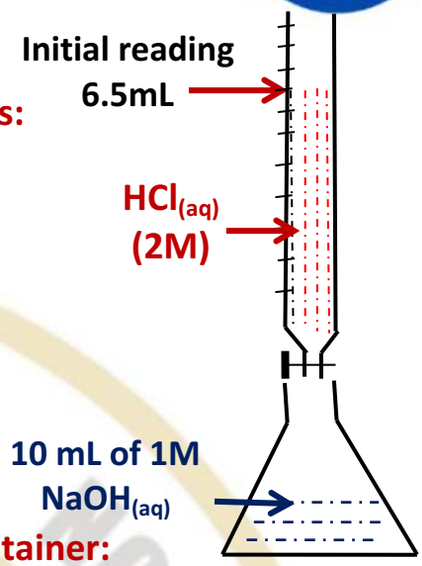
10- The opposite figure illustrates the titration of a sodium hydroxide solution using hydrochloric acid. Upon reaching the end point, the burette reading becomes:



a) 5 mL

b) 6.5 mL

c) 1.5 mL

d) 11.5 mL

11- The following reaction is at equilibrium in a closed container:

$$ICl_{(g)} + Cl_{2(g)} = ICl_{3(g)}$$

Dark Brown Yellow

When the container is placed in a basin of hot water, the mixture turns dark brown.
-Which of the following represents the type of reaction (exothermic or endothermic) And the change that decreases the intensity of the brown color?

a) Exothermic – Decreasing pressure
b) Endothermic – Increasing pressure
c) Exothermic – Decreasing vessel volume
d) Endothermic – Increasing vessel volume

12- Which of the following reactions represents equilibrium in an open container?

a) $CaCO_{3(s)} = CaO_{(s)} + CO_{2(g)}$
b) $2Cu(NO_3)_{2(s)} = 2CuO_{(s)} + 4NO_{2(g)} + O_{2(g)}$
c) $FeCl_{3\,(aq)} + 3NH_4SCN_{(aq)} = Fe(SCN)_{3(aq)} + 3NH_4Cl_{(aq)}$
d) $Zn_{(s)} + CuSO_{4(aq)} = ZnSO_4 + Cu_{(s)}$

13- When light falls on photographic film.
- Which of the following describes the chemical change that occurs?

a) Silver ions gain electrons from bromide ions.
b) Bromide ions gain electrons from silver ions.
c) Silver is oxidized to silver ions.
d) Bromide ions are reduced to bromine.

14- If the K_{sp} value of (AgCl) is 1.6×10^{-10}, then the concentration of dissolved ions in its saturated solution is:

a) 1.26×10^{-5} M
b) 2.53×10^{-5} M
c) 6.32×10^{-6} M
d) 1.6×10^{-10} M

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15- Which of the following represents the dissolved mass of $Ba(OH)_2$ in 1.5 L of pure water to form solution with a pH = 12.3? ($Ba(OH)_2$ = 171 g/mol)

a) 2.56 g b) 5.12 g c) 43.605 g d) 0.513 g

16- In the following equilibrium reaction:

$$2NO_{2\,(g)} \rightleftharpoons N_2O_{4\,(g)}\ ,\ K_p = 6.15$$

-At equilibrium, the partial pressure of NO_2 in the container is 0.15 atm. Therefore, The partial pressure of N_2O_4 is:

a) 0.0225 atm b) 0.1383 atm

c) 0.2767 atm d) 0.9225 atm

17- Which of the following describes what happens during the electrolysis of a Copper sulphate solution using copper electrodes?

a) The mass of the anode increases, and the concentration of copper ions in the Solution remains unchanged.

b) The mass of the cathode decreases, and the concentration of copper ions in the Solution increases.

c) The mass of the anode decreases, and the concentration of copper ions in the Solution decreases.

d) The mass of the cathode increases, and the concentration of copper ions in the Solution remains unchanged.

18- The following reaction represents a galvanic cell:

$$Fe_{(s)} + Pb^{+2}_{(aq)} \rightarrow Fe^{+2}_{(aq.)} + Pb_{(s)}$$

-Which of the following can be used as electrolyte solution in the salt bridge of this cell?

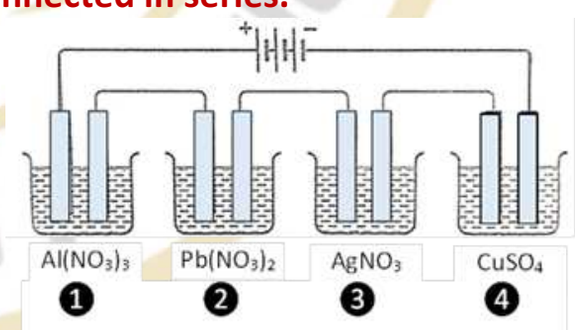
a) Sodium chloride b) Sodium carbonate

c) Sodium nitrate d) Ethyl alcohol

19- The diagram shows several electrolytic cells connected in series.

- Which of the cells shown has a greater increase In cathode weight?

(Al = 27, Pb = 208, Ag = 108, Cu= 63.5)



a) Cell (1)

b) Cell (2)

c) Cell (3)

d) Cell (4)

20- The following equation represents the reaction occurring in an electrolytic cell:

$$2X + 3CuSO_4 \rightarrow X_2(SO_4)_3 + 3Cu,\ E_{cell} = +1.8\ V$$

-Which of the following represents the reduction potential (X)?

($Cu \rightarrow Cu^{2+} + 2e^-, E^o$ - 0.34 V)

a) -2.14 V b) +1.46 V c) +2.14 V d) -1.46 V

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21- When a lead-acid battery is discharged, which of the following occurs as a result?

(a) The mass of the anode decreases and the mass of the cathode increases.

(b) The density of the solution increases and lead (II) ions form at the anode.

(c) The density of the solution decreases and the mass of the anode increases.

(d) The density of the solution increases and lead II ions form at the cathode.

22- The following table shows the reduction potentials of some elements:

A	B	C	D
-0.45 volt	-1.7 volt	-2.87 volt	-2.52 volt

Which of the following elements can be used as a scarifying electrode for element (B)?

a) A only b) D only c) A, C d) D, C

23- When propyl alcohol is dehydrated, compound (X) is produced.

- Which of the following represents an isomer of compound (X)?

a) Saturated with 3 methyl groups

b) Unsaturated with 3 methylene groups

c) Saturated and chemically active

d) Unsaturated and chemically active

24- Which of the following is the correct IUPAC name for a compound with the general Formula $C_nH_{2n-2}BrCl$?

a) 3-Bromo-1-chloro propyne

b) 1-Bromo-3-chloro propene

c) 2-Bromo-1-chloro butane

d) 1-Chloro-2-bromo-2-butene

25- Which of the following represents the number of isomers of the formula $C_4H_8O_2$ that can be reduced to compounds with the general formula $C_nH_{2n+2}O$?

a) 3 b) 2 c) 6 d) 5

26- Alkanes can be obtained by dry distillation of all of the following except:

a) Sodium butanoate b) 2- methyl sodium propanoate

c) Sodium Methanoate d) 3- methyl sodium pentanoate

27- A saturated aliphatic hydrocarbon (X) has the general formula C_nH_{2n} and Contains (6) methylene groups.

- Which of the following represents the correct order of processes required to obtain Compound (X) from calcium carbide?

a) Dropping water → Trimerization → Halogenation

b) Dropping water → Catalytic hydration → Oxidation

c) Dropping water → Trimerization → Hydrogenation

d) Thermal decomposition → Polymerization → Hydrogenation

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28- Which of the following is the correct order of chemical processes required to obtain an aliphatic insecticide with the formula $C_nH_nCl_n$ from An aliphatic compound with the formula C_nH_{2n+2} ?

a) Catalytic reforming - Halogenation in the presence of a catalyst.
b) Trimerization - Halogenation in the presence of UV.
c) Catalytic reforming - Halogenation in the presence of UV.
d) Trimerization - Halogenation in the presence of a catalyst.

29- Aromatic acid (A): is used in the manufacture of aspirin and is produced by Oxidation of substance (X).

Aliphatic acid (B): is used in the manufacture of plastics and is produced by Oxidation of substance (Y).

-Which of the following represents substances (X) and (Y)?

a) (X): Ethanol, (Y): Toluene
b) (X): Salicylic acid, (Y): Formic acid
c) (X): Para methyl phenol, (Y): Ethanol
d) (X): Ortho methyl phenol, (Y): Methanol

30- (X, Y) Organic compounds:

(X): Its molecular formula is $C_3H_8O_3$

(Y): Its general formula is $C_nH_{2n}O_2$ where (n) is Not less than 4.

When 1 mol of (X) reacts with 3 mol of (Y), compound (Z) is formed.

-Which of the following represents the use of compound (Z)?

a) Artificial arteries
b) Prevent blood clots
c) Soap manufacturing
d) Oil that decrease rheumatism pain.

31- (X, Y) Two isomers of hydrocarbons derivatives with the general formula $C_nH_{2n+2}O$, Each with a different functional group, (X) higher boiling point than (Y).

-Which of the following processes can be used to obtain the isomer (Y) from (X)?

a) Catalytic hydration
b) Complete oxidation
c) Heating with concentrated sulphuric acid at 180°C
d) Heating with concentrated sulphuric acid at 140°C

32- (A, B and C) Three organic compounds:

(A) An aliphatic hydroxyl acid, oxidizes to an acid containing a carboxyl group and a Ketone group.

(B) An aliphatic hydroxyl acid that does not decolorize acidified potassium permanganate.

(C) An aromatic hydroxyl acid that can be detected by iron (III) chloride solution.

- Which of the following represents the correct molecular formulas for the three compounds (A, B and C)?

	Compound (A)	Compound (B)	Compound (C)
a)	$C_3H_6O_3$	$C_6H_8O_7$	$C_7H_6O_3$
b)	$C_2H_4O_2$	$C_3H_6O_3$	C_6H_6O
c)	$C_3H_6O_3$	$C_2H_2O_4$	$C_7H_6O_2$
d)	$C_6H_8O_7$	$C_3H_6O_3$	$C_7H_6O_3$

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33- Which of the following represents the order of processes that occur on Magnetic iron oxide to obtain a reddish-brown precipitate?

a) Reaction with concentrated sulphuric acid followed by addition of ammonia Solution after a period of time.

b) Oxidation followed by reaction with dilute sulphuric acid followed by the addition Of ammonia solution.

c) Reduction at 430°C followed by reaction with dilute hydrochloric acid followed by The addition of ammonia solution.

d) Reaction with dilute hydrochloric acid followed by the addition of ammonia solution.

34- An impure sample of solid magnesium chloride weighing 10 g reacted completely with concentrated sulfuric acid. Then excess amount of sodium carbonate solution was added to the resulting solution, forming a precipitate weighing 7 g.

-Which of the following represents the percentage of magnesium chloride in the sample? (Mg=24, Na=23, C=12, Cl=35.5, O=16, S=32)

a) 16.79% b) 20.84% c) 79.16% d) 83.84

35- When a 5.34 g sample of hydrated iron chloride ($FeCl_x.6H_2O$) is heated intensely, at constant mass, 60.08% of the sample mass remains.

(Fe = 56, Cl = 35.5, H = 1, O = 16)

-The oxidation number of iron (x) in this compound is:

a) 1+ b) 2+ c) 3+ d) 6+

36-The following reaction: $NO + 1/2O_2 \rightleftharpoons NO_2$, takes place in a closed vessel At 25°C. Upon reaching equilibrium, the value of Kc becomes = 6.33.

-At a certain moment, the amount of substances was NO= 0.3 mol, O_2 = 0.3 mol, and NO_2 = 0.5 in a 2 L container at 25°C.

- Which of the following describes the state of the reaction at this moment?

a) The reaction is at equilibrium and the value of, Kc < 6.33.

b) The reaction is faster in the forward direction and Kc > 6.33.

c) The reaction is faster in the reverse direction

d) The reaction is faster in the forward direction

37- 0.2 mol of hydrocyanic acid is dissolved in one liter of water, and the concentration of the unionized acid in the solution is 0.167 M.

-The ionization constant of the acid at the same temperature is:

a) 4.18×10^{-3}

b) 5.45×10^{-3}

c) 3.03×10^{-3}

d) 6.06×10^{-3}

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38- The following table shows the oxidation potentials of some electrodes:

Electrode	X	Y	Z	W	E
Oxidation Potential	0.76 V	-0.34 V	1.67 V	2.37 V	-0.8 V

An electrolytic cell with two electrodes (X, Y).

-Which of the following changes to this cell leads to an increase in emf and a Change in the direction of the current?

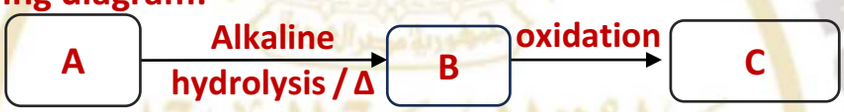
a) Replacing the anode with electrode W
b) Replacing the anode with electrode Z
c) Replacing the cathode with electrode W
d) Replacing the cathode with electrode E

39- When 0.1 F is passed through 5.85 g of pure molten sodium chloride.

- Which of the following results?

a) The molten partially decomposes and 4.6 g of sodium precipitates.
b) The molten completely decomposes and 2.3 g of sodium precipitates.
c) The molten completely decomposes and 7.1 g of chlorine gas is released.
d) The molten partially decomposes and 3.55 g of chlorine gas is released.

40- From the following diagram:



-Which of the following does not represent compounds A, B and C?

a) (A): 1-Chloro propane, (B): Isopropyl alcohol, (C): Propanoic acid
b) (A): Ethyl chloride, (B): Ethyl alcohol, (C): Acetic acid
c) (A): 2-Chloro propane, (B): Isopropyl alcohol, (C): Acetone
d) (A): 1-Chloro propane, (B): Propyl alcohol, (C): Propanoic acid

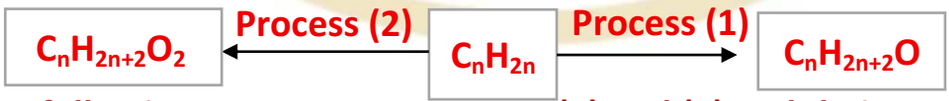
41- Which of the following represents the structural formula of the compound Formed from the reaction of the product from oxidation of ethyl alcohol with The product from reduction of benzoic?

(a) $C_6H_5CH_2OCOCH_3$ (b) $C_6H_5CH_2COOCH_3$ (C) $CH_3COOC_6H_5$ (d) $C_6H_5OCOCH_3$

42- When chemical processes (halogenation - reaction with benzene - nitration) are carried out respectively on a gas (found in coal mines), the resulting compound is:

a) Trinitrobenzene insecticide
b) Explosive TNT
c) Picric acid explosive
d) Gamixane insecticide

43- From the following diagram:



Which of the following represents processes (1) and (2) and their respective products?

a) (1): Oxidation producing a monohydric alcohol.
b) (2): Oxidation producing a dihydric alcohol.
c) (1): Catalytic hydration producing a dihydric alcohol.
d) (2): Catalytic hydration producing a monohydric alcohol.

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44- Which of the following represents the correct order of steps required to obtain the compound with the general formula $C_7H_6O_2$ from one of the products of the fractional distillation of coal tar?

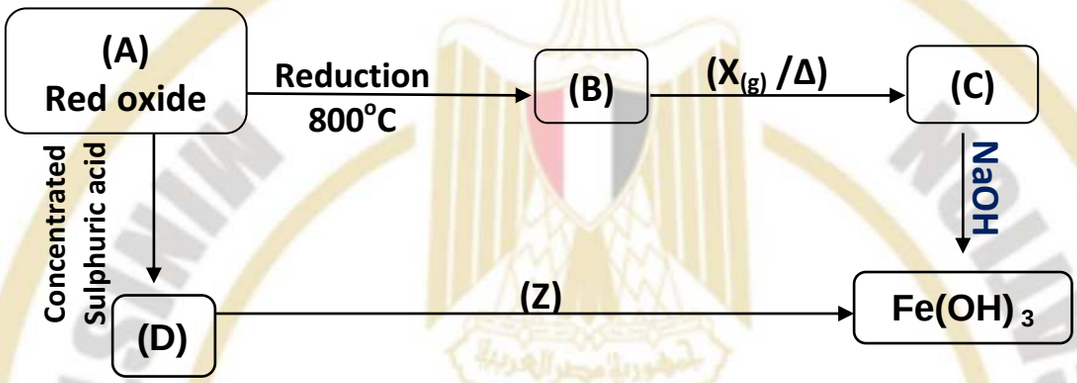
a) Alkylation → Oxidation → Esterification

b) Reduction → Alkylation → Oxidation.

c) Alkylation → alkaline hydrolysis → Reaction with acetic acid

d) Oxidation → Esterification → alkaline hydrolysis

45- The following diagram shows iron and some of its compounds:



1-Write the chemical formulas for each of the following:

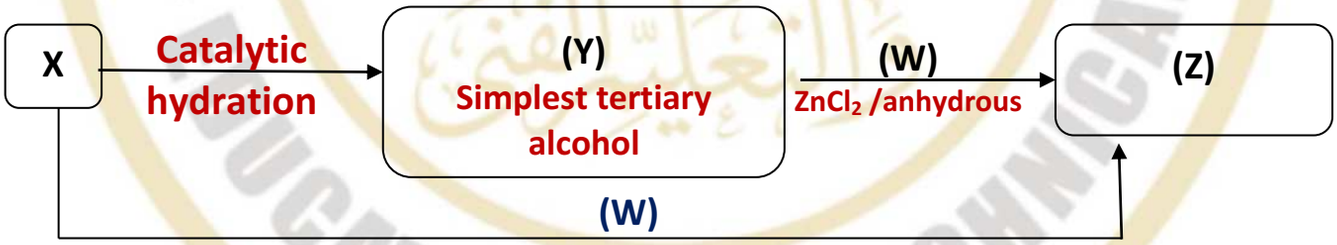
(C): .....

(D): .....

2-Write the chemical formula for intermetallic alloy of the substance (B)

3- Write the name of the compound (C) formed when ($X_{(g)}$) is replaced by dilute $HCl_{(aq)}$

46- From the following diagram:



- Write the IUPAC name for each of the following: (Z, X)
- Write the structural formula for the possible saturated isomers (X)

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Dr.MoRizK

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رقم السؤال	الاجـــــــابة
1	C
2	D
3	C
4	D
5	D
6	B

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7	C
8	B
9	A

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10	D
11	C
12	C
13	A
14	B
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15	A
16	B
17	D
18	C
19	C
20	D
21	C

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22	D
23	C
24	B
25	B
تم بواسطه موقع الدكتور محمد رزق التعليمي	
26	C
27	C
28	C
29	D
30	C
31	D
32	A

موقع الدكتور محمد رزق معلم الكيمياء التعليمي D.M.RAZK

A	33
C	34
C	35
D	36
B	37
C	38
B	39
A	40
A	41
B	42
B	43
B	44

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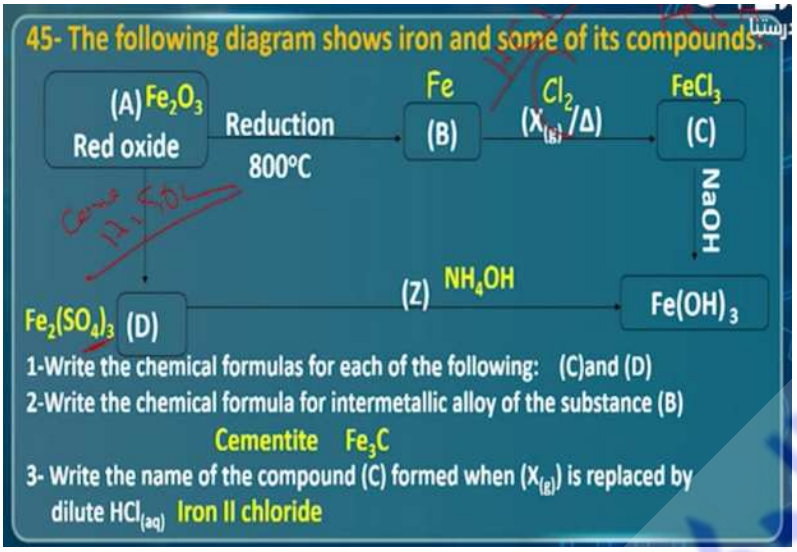
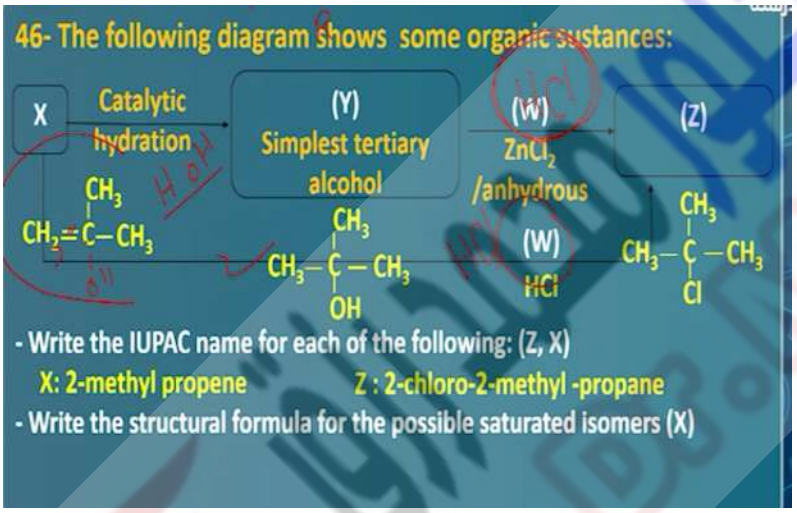
	45
 	46

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والمصدر قناه مدرستنا 3

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